



## **Environmental Resource Management, Inc.**

P.O. Box 5305, Bozeman, Montana 59717 Phone (406) 582-8491 email: [rwaller@wispwest.net](mailto:rwaller@wispwest.net)

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August 26, 2016

Mr. David Reinhardt  
Valley County Commissioner  
501 Court Square, Box 1  
Glasgow, Montana 59230

Subject: Pilot Test Work Plan  
Mike's Muffler, Glasgow, Montana  
DEQ Facility ID No. 53-13598  
DEQ Release No. 4333  
Work Plan ID 10327

Dear Mr. Reinhardt:

Environmental Resource Management is pleased to submit this document to outline activities associated with pilot testing to determine the radius of influence of a remediation system intended to mitigate subsurface petroleum contamination at the above referenced petroleum release site. Pilot testing will consist of installing an air injection (AI) well and a soil vapor extraction (SVE) well and connecting the wells to the existing pilot test SVE/AI equipment.

### **Site Location**

The Mike's Muffler petroleum release site is located within the city limits of Glasgow, Montana at 320 1<sup>st</sup> Avenue North as shown in Figure 1. The site is situated in the northeast quarter of the southwest quarter of Section 12, Township 28 North, Range 39 East, Montana Principal Meridian.

### **Site Geology**

Site geology is characterized by fine-grained fluvial sediments associated with the Milk River which is situated approximately 2000 feet southeast of the project site. Highly plastic, dense silty clay and sandy clay is interbedded with fine- to coarse-grained sand and gravel intervals. Local bedrock consists of the Cretaceous Bearpaw Shale and depth to bedrock is not precisely known. Groundwater is encountered at approximately 12-14 feet below ground surface. Shallow groundwater resources that were encountered during this investigation are not considered to be potable and are not utilized for human consumption.



### **Scope of Work**

Proposed tasks to be performed include installing and operating a pilot scale (SVE/AS) system, data collection, system design and reporting. These tasks are designed to gain further knowledge regarding the expected radius of influence of a SVE/AI system that may be used to mitigate the petroleum release at the project site.

### **Remediation Well Installation**

One air injection wells and one soil vapor extraction well will be installed at the locations shown on Figure 2. Drilling services will be provided by Boland Drilling, Great Falls, MT using a hollow stem auger drilling rig.

The air injection well will be completed at 25 feet below ground surface with one foot of one-inch diameter 0.020" slotted Schedule 40 PVC screen and 24 feet of blank casing. The soil vapor extraction well will be completed at 14 feet below ground surface with ten feet of four-inch diameter 0.020" slotted Schedule 40 PVC screen and four feet of blank casing.

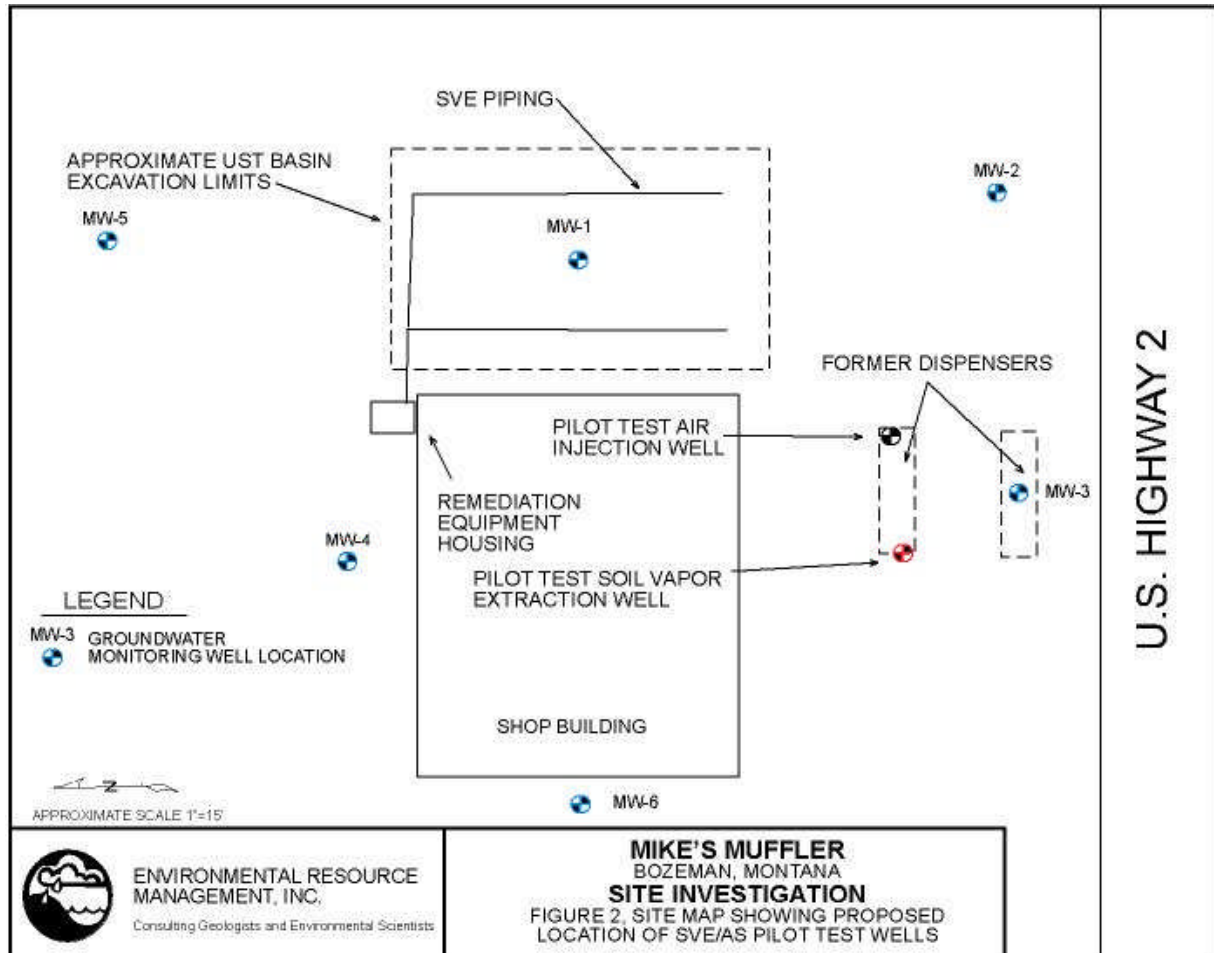
The bentonite seals in both of the pilot test wells will be allowed to hydrate for at least five days prior to operation of the pilot test.

### **SVE/AI Pilot Testing**

Service piping will be connected to the pilot test wells aboveground utilizing the existing remediation pilot test equipment. The pilot test will be operated for a total period of eight hours. The SVE component will be operated first and will be allowed to equilibrate for four hours before the AI component is activated. The AI component will then operate for approximately four hours.

During the initial SVE operation, negative pressure will be measured in monitoring wells MW-1, MW-2 and MW-3 using a set of magnehelic gauges. Volatile petroleum hydrocarbon production will be measured using a Photovac 2020 photo ionization detector (PID). Data collection will be conducted every 30 minutes for four hours.

After the four hour SVE pilot test period, the AI component will be activated and allowed to operate for four hours during which negative pressure and positive pressure will be measured in the surrounding monitoring wells. Volatile petroleum hydrocarbon production will be measured in the system effluent and dissolved oxygen content will be measured in the surrounding monitoring wells. Data collection will be conducted every 30 minutes for four hours.



### **Investigative Methods**

Methods practiced during this investigation will follow generally accepted practices of similar consulting firms in the same geographical area. Quality Assurance/ Quality Control methods will be employed throughout all phases of this investigation to ensure meaningful and reproducible results and data.

### **Health and Safety**

Health and safety issues will be addressed throughout this investigation to prevent exposure of site workers and other onsite personnel to potentially hazardous situations and chemical compounds. Several physical hazards will inherently be present throughout the field investigation while heavy equipment is being utilized for soil borings and monitoring well installation. Site specific health and safety precautions and information will be contained in a Health and Safety Plan which will remain onsite during all field activities.

## Project Costs

Costs associated with installation and operation of the pilot scale SVE/ AI system are summarized below.

<u>TASK</u>	<u>UNIT COST</u>	<u>COST</u>
<b><u>Task 1-Well Installation</u></b>		
Project management	3.0 hrs @ \$110/hr	\$330.00
Work plan prep	12 hrs. @ \$110/hr	1320.00
Mobilization, Bozeman to Glasgow	13 hrs @ \$90/hr	1170.00
Mileage, 4WD	1440 miles @ \$0.59/ mile	424.80
Per Diem	3 days @ \$23/ day	69.00
Lodging	3 nights @100/night	300.00
Drillhole logging, Scientist II	12.0 hrs @ \$90/hr	1080.00
PID rental	3 days @ \$74/day	222.00
Drilling services	Boland Drilling bid	4401.00
	<b><u>Subtotal</u></b>	<b><u>\$9316.80</u></b>
<b><u>Task 2-Remediation System Startup and Monitoring</u></b>		
Mobilization, RT from Bozeman	13 hrs @ \$90/hr	\$1170.00
Mileage, 4WD	720 miles @ \$0.59/ mile	424.80
Piping installation and data collection, Scientist II	13.0 hrs @ \$90/hr	1170.00
Per Diem	3 days @ \$23/ day	69.00
Lodging	2 nights @ \$100/night	200.00
PID rental	1 day @ \$74/day	74.00
Magnehelic gauge set rental	1 day @ \$42/day	42.00
YSI 556 meter for DO measurements	1 day @ \$90/day	90.00
Plumbing supplies		200.00
	<b><u>Subtotal</u></b>	<b><u>\$3439.80</u></b>
<b><u>Task 3-Reporting</u></b>		
Summary Report, Scientist II	16.0 hrs @ \$110/hr	\$1760.00
	<b><u>Subtotal</u></b>	<b><u>\$1760.00</u></b>
<b><u>TOTAL ESTIMATED COST</u></b>		<b><u>\$14,516.60</u></b>

## **Limitations**

This work was performed in accordance with generally accepted practices of other consulting firms conducting similar studies. ERM observed that degree of care and skill generally exercised by other consultants under similar conditions. Our findings and conclusions must not be considered as scientific certainties, but as opinions based upon our professional judgment based upon the data gathered during the course of this investigation. Other than this, no warranty is implied or intended.

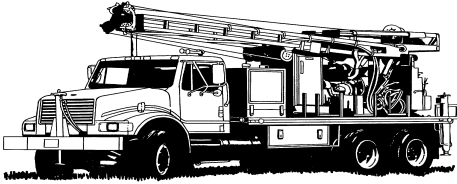
Submitted by  
Environmental Resource Management, Inc.

Robert H. Waller  
Project Geologist

cc: DEQ-PTCS  
MPTRCB

attachments: Drilling bids

# HAZTECH Drilling, Inc.



P.O. Box 30622  
2910 Hannon Road, Suite #6  
Billings, MT 59107  
Phone: 406-896-1164 or 800-359-1502  
Fax: 406-896-1462

## Proposal

TO: Environmental Resource Management, Inc.  
ATTN: Bob Waller  
P.O. Box 5305  
Bozeman, MT 59717  
Ph-406-582-8491-Cell

DATE: 8/29/2016

PROJECT: Glasgow, MT

### **Description:**

1-1" injection well to 25' with 1' of .020 screen. 1- TERMS: Net 30 Days  
4" SVE wells to 14' with 10' of .020 screen. With  
flush mounts.

	UNITS EST.	UNIT PRICE	AMOUNT EST.
*****	*****	*****	*****
Mob/ Demob, Per Mile	580	\$3.25	\$1,885.00
Support Truck, Per Day	3	\$100.00	\$300.00
Perdiem, Per Crew Day	3	\$46.00	\$138.00
Lodging, Per Night, Estimated	2	\$300.00	\$600.00
Auger Drilling Injection Wells, Per Ft	25	\$18.50	\$462.50
Well Installation Injection Wells, Per Ft	25	\$20.50	\$512.50
Auger Drilling SVE Wells, Per Ft	14	\$18.50	\$259.00
Well Installation SVE Wells , Per Ft	14	\$44.00	\$616.00
12 X 12 Flush Mount Vaults with Concrete, Each	1	\$110.00	\$110.00
8 X 12 Flush Mount Vault with Concrete, Each	1	\$90.00	\$90.00
*****			*****
ESTIMATED TOTAL:			\$4,973.00

### **Notes:**

- 1) Client is responsible to clear location of utilities.
- 2) Client is responsible for disposal of drill cuttings.
- 3) Client will be invoiced only the amounts used.
- 4) We assume that site is accessible by truck mount drill rig.

Proposal By:

Paul Bray



# Petroleum Tank Release Compensation Board

## Soil Boring/Monitoring Well Installation Unit Cost Worksheet

### Contractor Information

Company Name: Boland Drilling

Address: 4701 N Star Blvd

City, State, Zip: Great Falls, MT 59405

Cost Estimator: Chris Boland

Signature:



Phone: 406-761-1063

8/30/2016

### Project Information and Specifications

Address:

Glasgow

#### Type of Drilling Equipment

Hollow-Stem Augers

Air Rotary

Direct Push

Other (please specify)

#### Soil Boring

Number of Borings

Boring Diameter (inches)

Depth (per boring - ft)

Surface: Concrete Asphalt Barren

Soil Disposal: Onsite Stockpile Drums

Abandonment: Bentonite Soil Cuttings

#### Soil Sampling

Continuous Soil Sampling

Interval Soil Sampling (specify interval)

No Sampling

Facility ID #

Release #

WP ID #

#### Monitoring Well Specifications

Number of Wells

Surface: Concrete Asphalt Barren

Depth (per well)

Estimated Depth to Groundwater (ft)

Boring Diameter (inches)

Casing Diameter and type (inches)

Surface Completion: Flush Mount Aboveground

x

2
8&10
14 & 24

2
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14 & 24
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8 & 10
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1 & 4
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### Cost Estimate Explanation:

- (1) **Mobilization/Demobilization:** Includes all costs and mileage to transport equipment, materials, and personnel to and from the site location. More than one mobilization event of either the drilling rig or support vehicle will require justification and pre-approval by the DEQ-PRS and Board staffs. This item should be estimated on a per mile unit rate
- (2) **Soil Boring Installation:** Includes all costs (labor, equipment, and materials) to drill, collect soil samples and abandon soil borings, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.
- (3) **Monitoring Well Installation:** Includes all costs (labor, equipment, and materials) to drill, collect soil samples, and complete monitoring well to specifications and according to Montana Well Drillers Board rules, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.
- (4) **Drilling Standby:** Drilling standby should be estimated on an hourly basis. Prior approval and justification for accumulating standby time is needed prior to billing.
- (5) **Well Development:** Includes all costs (labor, equipment, and materials) to develop monitoring wells. This task should be estimated using a per well unit rate.
- (6) **Monitoring Well Abandonment:** Includes all costs (labor, equipment, and materials) to properly abandon a well location according to the Montana Well Drillers Board rules. Abandonment costs should be estimated using a per well unit rate.

# Soil Boring/Monitoring Well Installation Unit Cost Worksheet

TASK		UNIT COST	NUMBER OF UNITS	TOTAL COST
<b>Mobilization/Demobilization (1)</b>				
Mobilization/Demobilization: Drilling Rig	\$	2.00 /mile	550	\$ 1,100.00
Mobilization/Demobilization: Support Vehicle	\$	1.50 /mile	550	\$ 825.00
<b>Soil Boring Installation (2)</b>				
Drilling (0'-50' range per boring)	\$	28.00 /foot	39	\$ 1,092.00
Drilling (50'-100' range per boring)		/foot		\$ -
Other (please specify) _____				\$ -
<b>Monitoring Well Installation (3)</b>				
Drilling (0'-50' range per well)	\$	28.00 /foot	39	\$ 1,092.00
Drilling (50'-100' range per well)		/foot		\$ -
Other (please specify) _____				\$ -
<b>Drilling Standby (4)</b>				
-prior approval needed	\$	110.00 /hour		\$ -
<b>Well Development (5)</b>				
Well Development	\$	100.00 /well		\$ -
<b>Monitoring Well Abandonment (6)</b>				
Abandonment	\$	100.00 /well		\$ -
<b>Lodging may only be paid at actual costs when documented by receipts.</b>				
<b>Per Diem</b>				
Lodging: number of individuals =	2	\$ 100.00 /person per day	1	\$ 200.00
Food: number of individuals =	2	\$ 23.00 /person per day	2	\$ 92.00
(Breakfast 5.00, Lunch 6.00, Dinner 12.00)				
<b>TOTAL PROJECT EXPENSE</b>				<b>\$ 4,401.00</b>

D.O.T. Drums

\$95.00

Additional Conditions/Comments/Costs:

Drill one 4" well and one 1" well at Glasgow, MT

If you require assistance, call 406-841-5090.

Submit completed form to:

Petroleum Tank Release Compensation Board PO Box 200902, Helena MT 59620-0902